



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/805,869

03/22/2004

Joseph Gerard Birmingham

BIRM3002/TJM

1786

23364 7590 08/22/2008

BACON & THOMAS, PLLC

625 SLATERS LANE

FOURTH FLOOR

ALEXANDRIA, VA 22314-1176

EXAMINER

KURTZ, BENJAMIN M

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

08/22/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/805,869	<b>Applicant(s)</b> BIRMINGHAM ET AL.	
	<b>Examiner</b> BENJAMIN KURTZ	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 24-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

Claims 24-43 are pending, claims 1-23 are cancelled.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 24-43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention without undue experimentation.

Applicant only mentions micro-pillars in relation to the current invention in paragraph 32 of the disclosure. Applicant also mentions micro-pillars in relation to the prior art to Birmingham et al. US 6 110 247. The applicant has not provided a definition of what is meant by a micro-pillar or what particular structure the micro-pillar has to distinguish it over any other structure. One of ordinary skill in the art would look to the prior art to Birmingham to determine a possible meaning of what is meant by a micro-pillar. The prior art teaches a micro-pillar that is perpendicular to a sheet while the present invention teaches the micro-pillars are in the plane of the sheet. Applicant has stated in the arguments dated 8/12/08 that the prior art teaches the preparation of

micro-pillars, however the configuration of the prior art micro-pillars appears to be different than the claimed configuration and it is unclear how or if the same methods of preparation as taught in the prior art would be applicable to the present invention. The applicant has not provided suitable direction in the claims or in the specification as to what structure is being claimed by the recitation of a micro-pillar as only one paragraph briefly mentions such an embodiment and there are no depictions in the figures to show such a feature.

Although it is unclear exactly what structure applicant is claiming, the office has applied what appears to be relevant prior art.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**2. Claims 24-28, 31-33 and 36-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Spencer US 3 900 629.**

Claim 24, Spencer teaches a microimpactor system comprising a fluid conduit having a plurality of spaced-apart rows of microimpactors (16) arranged in the fluid conduit substantially transverse to a main direction of flow of fluid through the fluid

conduit, wherein each of said rows of microimpactors is formed by a microimpactor sheet (12) having a plurality of openings (14) in the sheet that define in each such sheet at least one line of two or more microimpactors, wherein each of said rows of microimpactors is in the plane of the sheet, and wherein each of the microimpactors is a micro-pillar (fig. 1, 2). A pillar is assumed to be an upright shaft or structure relatively slender in proportion to its height, of any shape in section (Dictionary.com). The microimpactor of Spencer reads on this definition and is therefore deemed to meet the limitations of the claim.

Claims 25-28, Spencer further teaches microimpactors in at least two successive rows are offset from each other (fig. 2); microimpactors in successive rows are spaced apart at a distance defined by one or more spacer sheets (12) interposed between the successive sheets of microimpactors (fig. 2); the fluid conduit includes a fluid inlet and a fluid outlet and each of said sheets is a flat sheet (fig. 2); and the system further comprises means for moving fluid through the system (fig. 2, col.1, line 9-11) which performs the identical function in substantially the same way with substantially the same results as the fans or pumps disclosed herein.

Claims 31-33 and 38-40, Spencer teaches a microimpactor system comprising a fluid conduit having a plurality of spaced-apart rows of microimpactors (16) arranged in the fluid conduit substantially transverse to a main direction of flow of fluid through the fluid conduit, wherein each of said rows of microimpactors is formed by a microimpactor sheet (12) having a plurality of openings (14) in the sheet that define in each such sheet at least one line of two or more microimpactors, wherein each of said rows of

Art Unit: 1797

microimpactors is in the plane of the sheet and a spacing between the rows of microimpactors is ~51 microns (the thickness of a sheet (12) is the spacing between sheets as shown in fig. 2) and each of the microimpactors is a micropillar (fig. 1, 2, col. 2, lines 56-60). A pillar is assumed to be an upright shaft or structure relatively slender in proportion to its height, of any shape in section (Dictionary.com). The microimpactor of Spencer reads on this definition and is therefore deemed to meet the limitations of the claim.

Claims 34, 36 and 37, Spencer further teaches the microimpactors (the strips) are ~254 microns wide (col. 2, lines 56-60); and the spacing between adjacent microimpactors is ~89 microns (col. 2, lines 56-60).

Claims 41 and 42, Spencer teaches a microimpactor system comprising: a first microimpactor sheet (12), a second microimpactor sheet (12), and a first spacer sheet (12) between the first and second microimpactor sheets, wherein the first microimpactor sheet is rigid and comprises a first row that comprises a first spacing (14), a first microimpactor (16), a second spacing (14), a second microimpactor (16) and a third spacing (14), wherein the first and second microimpactors are in the plane of the first microimpactor sheet and wherein the second microimpactor sheet is rigid and comprises a second row that comprises a fourth spacing (14), a third microimpactor (16), a fifth spacing (14), and a fourth microimpactor (16) and a sixth spacing (14), wherein the third and fourth microimpactors are in the plane of the second microimpactor sheet and wherein the first through sixth spacings define a fluid conduit and wherein the first microimpactor comprises a first micropillar and the second

microimpactor comprises a second micropillar (fig. 1, 2). A pillar is assumed to be an upright shaft or structure relatively slender in proportion to its height, of any shape in section (Dictionary.com). The microimpactor of Spencer reads on this definition and is therefore deemed to meet the limitations of the claim.

**3. Claims 24-28, 41 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Uram US 4 721 567.**

Claim 24, Uram teaches a microimpactor system comprising: a fluid conduit having a plurality of spaced apart rows of rigid microimpactors (12) arranged in the fluid conduit substantially transverse to a main direction of flow, wherein each of the rows of microimpactors is formed by a microimpactor sheet (11) having a plurality of openings (13) in the sheet defined in each such sheet at least one line of two or more microimpactors, wherein each of the rows of microimpactors is in the plane of the sheet and wherein each of the microimpactors is a micropillar (fig. 1). A pillar is assumed to be an upright shaft or structure relatively slender in proportion to its height, of any shape in section (Dictionary.com). The microimpactor of Uram reads on this definition and is therefore deemed to meet the limitations of the claim.

Claims 25-28, Uram further teaches at least two successive rows are offset from each other (fig. 1); microimpactors in successive rows are spaced apart at a distance defined by one or more spacer sheets (41) interposed between the successive rows of microimpactors (fig. 15); the fluid conduit includes a fluid inlet and outlet and each sheet

is a flat sheet (fig. 1); the microimpactor system further includes a means, gravity, for moving fluid through the system, which performs the same function in substantially the same way as the fan or pumps disclosed herein, in that fluid passes through the system (col. 1, lines 5-13).

Claims 41 and 42, Uram teaches a microimpactor system comprising: a first microimpactor sheet (11), a second microimpactor sheet (11), and a first spacer sheet (41) between the first and second microimpactor sheets, wherein the first microimpactor sheet is rigid and comprises a first row that comprises a first spacing (13), a first microimpactor (12), a second spacing (13), a second microimpactor (12) and a third spacing (13), wherein the first and second microimpactors are in the plane of the first microimpactor sheet and wherein the second microimpactor sheet is rigid and comprises a second row that comprises a fourth spacing (13), a third microimpactor (12), a fifth spacing (13), and a fourth microimpactor (12) and a sixth spacing (13), wherein the third and fourth microimpactors are in the plane of the second microimpactor sheet and wherein the first through sixth spacings define a fluid conduit and wherein the first microimpactor comprises a first micropillar and the second microimpactor comprises a second micropillar (fig. 1, 2, 15). A pillar is assumed to be an upright shaft or structure relatively slender in proportion to its height, of any shape in section (Dictionary.com). The microimpactor of Uram reads on this definition and is therefore deemed to meet the limitations of the claim.

***Claim Rejections - 35 USC § 103***



The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**4. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer '629.**

Spencer teaches the microimpactor being 254 microns but not 10-150 microns wide. The only difference between the prior art and the invention as claimed in a recitation of relative dimension. [W]here the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, *Gardner v. TEC Systems, Inc.*, 220 USPQ 777 (1984).

**5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer '629 in view of Stevens US 3 633 751.**

Spencer teaches the microimpactor system of claim 24 but does not teach a means for applying an electrical charge to at least one microimpactor sheet. Stevens teaches a microimpactor system comprising a means for applying an electrical charge

to at least one microimpactor sheet (col. 3, lines 9-20) which performs the identical function in substantially the same way with substantially the same results as the electrical circuitry disclosed herein. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the electrical charge because is can shake the microimpactor sheet to release any adherent material (col. 3, lines 9-20).

**6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer '629 in view of Stevens '751 as applied to claim 29 above, and further in view of Carr US 3 999 964.**

Spencer in view of Stevens teaches the microimpactor system of claim 29 but does not teach means upstream from the microimpactor sheets for applying an electrical charge to particles borne in a fluid transported through the fluid conduit. Carr teaches a filter system where the particles in a fluid are charged upstream of the filter device (col. 2, line 64 – col. 3, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the upstream charging of particles as taught by Carr because the charge enhances the particles adherence to the collector (col. 1, lines 22-31).

**7. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer '629 in view of Uram '567.**

Spencer further teaches the first spacer sheet has a first thickness of 51 microns, each of the first, second and third spacing is 89 microns, each of the first and second microimpactor sheets has a thickness of 51 microns (col. 2, lines 56-60). Spencer does not teach each of the first and second microimpactors having a width of about 10-150 microns or the third and fourth microimpactor having a width different from the first width and the fourth, fifth and sixth spacing having a different spacing than the first, second and third spacing.

Spencer teaches the first and second microimpactors having a width of 254 microns. The only difference between the prior art and the invention as claimed in a recitation of relative dimension. [W]here the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, *Gardner v. TEC Systems, Inc.*, 220 USPQ 777 (1984).

Uram teaches a microimpactor having microimpactor sheets with different spacing sizes than other sheets. (col. 3, lines 58-68). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use different widths and spacing as taught by Uram because it provides successive filtering layers where different sized particles are trapped at different layers of the filter, this feature being well known in the filter art.

### ***Response to Arguments***

Art Unit: 1797

8. Applicant's arguments filed 8/12/08 have been fully considered but they are not persuasive.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN KURTZ whose telephone number is (571)272-8211. The examiner can normally be reached on Monday through Friday 8:00am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Benjamin Kurtz  
Examiner  
Art Unit 1797

8/20/08                    /BK/

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797